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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/022,456	12/14/2001	Ebrahim Andideh	042390P13229	1704

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11/06/2002

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EXAMINER

VU, HUNG K

ART UNIT PAPER NUMBER

2811

DATE MAILED: 11/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/022,456

Applicant(s)

ANDIDEH, EBRAHIM

Examiner

Hung K. Vu

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 8-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) 1-7 and 19-23 is/are allowed.
- 6) ☒ Claim(s) 1-7, 19-23 is/are rejected. T.T.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Invention of Group I, Claims 1-7 and 19-23, in Paper No. 5 is acknowledged.

Claims 8-18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 5.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Gnade et al. (PN 5,561,318).

Gnade et al. discloses, as shown in Figures 1D, 2 and 4-7, a structure comprising a multilayer stack of thin films (27,28,29), the thin films comprising a low-dielectric constant material, the thin films having pores.

With regard to claims 2, Gnade et al. discloses the low-dielectric constant material comprises an inorganic oxide (aerogel). Note the table.

Art Unit: 2811

With regard to claims 3, Gnade et al. discloses the inorganic oxide comprises aerogel which is Silicon Dioxide.

With regard to claims 4, Gnade et al. discloses thin films (27 and 29) have a porosity of 15 volume % to 50 volume % (within a range of below about 30.0 volume %). Note Figures 3D and 4, Col. 3, lines 21-29, Col. 7, lines 19-23, and Col. 10, lines 23-30.

With regard to claims 5, Gnade et al. discloses pores are embedded within the thin films.

With regard to claims 6, Gnade et al. discloses pores are unconnected.

With regard to claims 7, Gnade et al. discloses pores have a size on the order of 2 nm to 25 nm (within the range of 0.3 – 3.0 nm). Note Col. 3, lines 59-62.

3. Claims 19-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Havemann et al. (PN 5,488,015).

Havemann et al. discloses, as shown in Figures 3D and 6H, a multilevel interconnect system comprising,

a first metal level (AlCu₂₄);

a multilayer stack (28,30, and/or 56) disposed over the first metal level, the multilayer stack comprising:

a thin film (28), the thin film having a low dielectric constant, the thin film having pores;

a second metal level (AlCu₃₄) disposed over the multilayer stack.

With regard to claim 20, Havemann et al. discloses thin films have a porosity of 30 volume % to 95 volume % (note that the claimed language states about 30.0 volume % which can be 30.1, 30.2, 30.3, etc.). Note Col. 3, lines 19-21.

With regard to claim 21, Havemann et al. discloses pores are embedded within the thin film.

With regard to claims 22, Havemann et al. discloses pores are unconnected.

With regard to claim 23, Havemann et al. discloses pores have a size between 2 nm to 25 nm (within the range of 0.3 – 3.0 nm). Note Col. 3, lines 17-19.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung K. Vu whose telephone number is (703) 308-4079. The examiner can normally be reached on Mon-Thurs 7:00-4:30 and every other Friday 7:00-3:30, Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the

Art Unit: 2811

organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Vu

November 1, 2002

Hung Vu